**Code to find determinant of a matrix**

**C program to calculate determinant of a matrix**

#include<stdio.h>

int main(){

  int a[3][3],i,j;

  int determinant=0;

  printf("Enter the 9 elements of matrix: ");

  for(i=0;i<3;i++)

      for(j=0;j<3;j++)

           scanf("%d",&a[i][j]);

  printf("\nThe First matrix is\n");

  for(i=0;i<3;i++){

      printf("\n");

      for(j=0;j<3;j++)

           printf("%d\t",a[i][j]);

  }

  for(i=0;i<3;i++)

      determinant = determinant + (a[0][i]\*(a[1][(i+1)%3]\*a[2][(i+2)%3] - a[1][(i+2)%3]\*a[2][(i+1)%3]));

  printf("\nDeterminant of matrix is: %d",determinant);

   return 0;

}

**C code for Determinant of 2X2 matrix:**

#include<stdio.h>

int main(){

  int a[2][2],i,j;

  long determinant;

  printf("Enter the 4 elements of matrix: ");

  for(i=0;i<2;i++)

      for(j=0;j<2;j++)

           scanf("%d",&a[i][j]);

  printf("\nThe matrix is\n");

  for(i=0;i<2;i++){

      printf("\n");

      for(j=0;j<2;j++)

           printf("%d\t",a[i][j]);

  }

  determinant = a[0][0]\*a[1][1] - a[1][0]\*a[0][1];

  printf("\nDeterminant of 2X2 matrix: %ld",determinant);

   return 0;

}

Enter the 4 elements of matrix: 4

8

3

9

The matrix is

4       8

3       9

Determinant of 2X2 matrix: 12

**C code for Determinant of 3X3 matrix:**

#include<stdio.h>

int main(){

  int a[3][3],i,j;

  long determinant;

  printf("Enter the 9 elements of matrix: ");

  for(i=0;i<3;i++)

      for(j=0;j<3;j++)

           scanf("%d",&a[i][j]);

  printf("\nThe matrix is\n");

  for(i=0;i<3;i++){

      printf("\n");

      for(j=0;j<3;j++)

           printf("%d\t",a[i][j]);

  }

  determinant = a[0][0]\*((a[1][1]\*a[2][2]) - (a[2][1]\*a[1][2])) -a[0][1]\*(a[1][0]\*a[2][2] - a[2][0]\*a[1][2]) + a[0][2]\*(a[1][0]\*a[2][1] - a[2][0]\*a[1][1]);

  printf("\nDeterminant of 3X3 matrix: %ld",determinant);

   return 0;

}

Sample output:

Enter the 9 elements of matrix: 1

2

3

4

5

6

7

8

9

The matrix is

1       2       3

4       5       6

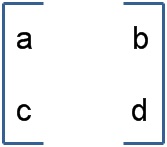
7       8       9

Determinant of 3X3 matrix: 0

Alogrithm:

Determinant is possible only for square matrixes i.e. n by n matrixes.

**Determinant of 2 by 2 matrix:**

[](http://2.bp.blogspot.com/-IyMUkBXopig/TmJ5AZ0Y7CI/AAAAAAAABYg/iPMOjMlOJ8I/s1600/2by2.png)

Determinant of matrix has defined as: ad – cb

**Determinant of 3 by 3 matrix:**

Determinant of matrix has defined as: a00(a11\*a22 – a21\*a12) + a01(a10\*a22 – a20\*a12) + a02(a10\*a21 – a20\*a11)